

We claim:

1. A method for communicating routes in a packet-based network, the method for use at a first router comprised in a first autonomous system, the method comprising the steps of:

5 receiving a first routing message from a peer router of said first router, the first routing message comprising a first path from the first autonomous system to a destination, the first path from the first autonomous system to the destination including a second autonomous system, the second autonomous system being a next hop of said first path;

10 receiving a second routing message from a peer router of said first router, the second routing message comprising a second path from the first autonomous system to the destination, the second path from the first autonomous system to the destination being different from the first path from the first autonomous system to the destination, the second autonomous system also being a next hop of said second path; and

15 sending a third routing message to one or more internal peer routers of said first router, said one or more internal peer routers comprised in said first autonomous system, the third routing message comprising at least both the first path from the first autonomous system to the destination and the second path from the first autonomous system to the destination.

20 2. The method of claim 1 wherein the packet-based network comprises the Internet.

3. The method of claim 1 wherein the first routing message and the second routing message are in conformance with a Border Gateway Protocol.

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4. The method of claim 3 wherein said first router and said one or more internal peer routers comprised in the first autonomous system are comprised in a set of routers which communicate routes with use of a route reflection architecture.

5. The method of claim 3 wherein said first router and said one or more internal peer routers comprised in the first autonomous system are comprised in a set of routers which communicate routes with use of a full mesh architecture.

5 6. The method of claim 3 wherein the first path and the second path have been selected from a set of paths from the first autonomous system to the destination, each of said paths having said second autonomous system as a next hop thereof.

10 7. The method of claim 6 wherein said first path and said second path have equal and maximum values of a degree-of-preference attribute among the paths in said set of paths from which the first path and the second path have been selected, equal and minimum values of a length of an autonomous-system-path attribute among the paths in said set of paths from which the first path and the second path have been selected, and equal and minimum values of a multi-exit-discriminator attribute among
15 the paths in said set of paths from which the first path and the second path have been selected.

20 8. The method of claim 1 further comprising the step of selecting a best path from said first router to said destination, said best path being selected from a set of paths from said first autonomous system to said destination which includes said first path and said second path and which are comprised in said third routing message.

9. The method of claim 8 wherein said step of selecting a best path comprises:

25 initializing a set of possible best paths to said set of paths from said first autonomous system to said destination which includes said first path and said second path and which are comprised in said third routing message;

eliminating from the set of possible best paths any paths which include a route internal to said first autonomous system if there are any paths which do not include a
30 route internal to said first autonomous system in said set of possible best paths;

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removing from the set of possible best paths any paths that do not have a minimum value of an Internal Gateway Protocol cost among the set of possible best paths; and

selecting, as the best path, a path that remains in said set of possible best paths
5 after said eliminating step and said removing step.

10 **10.** The method of claim 9 wherein said step of selecting, as the best path, a path that remains in said set of possible best paths, comprises selecting a path based on a speaker-number value of a router from which said path was originated.

10 **11.** A first router comprised in a first autonomous system, the first router operable to communicate routes in a packet-based network, the first router comprising:

15 means for receiving a first routing message from a peer router of said first router, the first routing message comprising a first path from the first autonomous system to a destination, the first path from the first autonomous system to the destination including a second autonomous system, the second autonomous system being a next hop of said first path;

20 means for receiving a second routing message from a peer router of said first router, the second routing message comprising a second path from the first autonomous system to the destination, the second path from the first autonomous system to the destination being different from the first path from the first autonomous system to the destination, the second autonomous system also being a next hop of said second path; and

25 means for sending a third routing message to one or more internal peer routers of said first router, said one or more internal peer routers comprised in said first autonomous system, the third routing message comprising at least both the first path from the first autonomous system to the destination and the second path from the first autonomous system to the destination.

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12. The first router of claim 11 wherein the packet-based network comprises the Internet.

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13. The first router of claim 11 wherein the first routing message and the second routing message are in conformance with a Border Gateway Protocol.

5 14. The first router of claim 13 wherein said first router and said one or more internal peer routers comprised in the first autonomous system are comprised in a set of routers which communicate routes with use of a route reflection architecture.

10 15. The first router of claim 13 wherein said first router and said one or more internal peer routers comprised in the first autonomous system are comprised in a set of routers which communicate routes with use of a full mesh architecture.

15 16. The first router of claim 13 wherein the first path and the second path have been selected from a set of paths from the first autonomous system to the destination, each of said paths having said second autonomous system as a next hop thereof.

20 17. The first router of claim 16 wherein said first path and said second path have equal and maximum values of a degree-of-preference attribute among the paths in said set of paths from which the first path and the second path have been selected, equal and minimum values of a length of an autonomous-system-path attribute among the paths in said set of paths from which the first path and the second path have been selected, and equal and minimum values of a multi-exit-discriminator attribute among the paths in said set of paths from which the first path and the second path have been selected.
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30 18. The first router of claim 11 further comprising means for selecting a best path from said first router to said destination, said best path being selected from a set of paths from said first autonomous system to said destination which includes said first path and said second path and which are comprised in said third routing message.

19. The first router of claim 18 wherein said means for selecting a best path comprises:

means for initializing a set of possible best paths to said set of paths from said first autonomous system to said destination which includes said first path and said
5 second path and which are comprised in said third routing message;

means for eliminating from the set of possible best paths any paths which include a route internal to said first autonomous system if there are any paths which do not include a route internal to said first autonomous system in said set of possible best paths;

10 means for removing from the set of possible best paths any paths that do not have a minimum value of an Internal Gateway Protocol cost among the set of possible best paths; and

means for selecting as the best path a path that remains in said set of possible best paths after operation of said eliminating means and said removing means.

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20. The first router of claim 19 wherein said means for selecting as the best path a path that remains in said set of possible best paths comprises means for selecting a path based on a speaker-number value of a router from which said path was originated.

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